

## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1619	desulfurization and mercaptan	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:09
L2	1528	mercaptan with (oxygen or air)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:10
L3	427	L2 same catalyst	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:10
L4	336	L3 and (VII or VIII or I or transition metal)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:10
L5	295	L4 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:35
L6	41	L5 and desulfurization	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:28
L7	1	"6579444".pn.	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:28
L8	33	("2460227"   "3185641"   "4011882"   "4149965"   "4149966"   "4464252"   "4634515"   "4775462"   "4908122"   "5157201"   "5160045"   "5199978"   "5250181"   "5259946"   "5322615"   "5423975"   "5525211"   "5525233"   "5599441"   "5618408"   "5674378"   "5807475"   "5837131"   "5853570"   "5863419"   "5866749"   "6048451"   "6059962").PN. OR ("6579444"). URPN.	US-PGPUB; USPAT; USOCR	ADJ	ON	2007/08/14 11:28
L9	15	8 and oxygen and mercaptan	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:29
L10	0	8 and (mercaptan oxidiz\$4 (oxygen or air))	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:35
L11	1	8 and (mercaptan (oxygen or air))	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:31
L12	1	"6440299".pn.	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:31
L13	31	("3186935"   "3531542"   "3839486"   "4186146"   "4194964"   "4213847"   "4222961"   "4232177"   "4336407"   "4439350"   "4523048"   "4740633"   "4746419"   "4761509"   "4774375"   "4822936"   "4886594"   "4902842"   "5012021"   "5087780"   "5151172"   "5154819"   "5314614"   "5510568").PN. OR ("6440299").URPN.	US-PGPUB; USPAT; USOCR	ADJ	ON	2007/08/14 11:31

## EAST Search History

L14	12	13 and (oxygen or air)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:33
L15	0	13 and (mercaptan (oxygen or air))	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:33
L16	1	13 and (mercaptan same (oxygen or air))	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:33
L17	3	(mercaptan oxidiz\$4 (oxygen or air)) and distillation	US-PGPUB; USPAT	ADJ	ON	2007/08/14 13:20
L18	1	"5907064".pn.	US-PGPUB; USPAT	ADJ	ON	2007/08/14 13:20
L19	29	(US-20030178342-\$ or US-20020157990-\$ or US-20030116474-\$ or US-20030089639-\$ or US-20040007502-\$ or US-20030205510-\$ or US-20020130062-\$ or US-20040026297-\$ or US-20040152004-\$ or US-20020161237-\$).did. or (US-7223332-\$ or US-5730860-\$ or US-6579444-\$ or US-6440299-\$ or US-7153415-\$ or US-6802961-\$ or US-6444118-\$ or US-6228254-\$ or US-7220886-\$ or US-5595634-\$ or US-5510568-\$ or US-6156190-\$ or US-5026950-\$ or US-6175007-\$ or US-4700004-\$ or US-6485633-\$ or US-7192565-\$ or US-4822936-\$ or US-4213847-\$).did.	US-PGPUB; USPAT	ADJ	ON	2007/08/14 13:51
L20	11	19 and clay	US-PGPUB; USPAT	ADJ	ON	2007/08/14 13:52
L25	18	19 and ppm	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:18
L26	21	19 and water	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:18
L27	184909	hydrocarbon and (solvent same water)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:35
L28	26198	hydrocarbon and (solvent same water) and miscible	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:37
L29	2100	(208/208r,213,215,217,240,244, 246,249).CCLS.	US-PGPUB; USPAT	OR	OFF	2007/08/14 14:35
L30	23	28 and L29	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:58
L31	20	30 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:37
L32	132	(solvent same water) and miscible hydrocarbon	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:40

## EAST Search History

L33	120	32 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:40
L34	6	33 and L29	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:37
L35	100	water same miscible hydrocarbon	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:41
L36	4	35 and L29	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:41
L37	3	36 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:41
L38	20	water miscible hydrocarbon	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:41
L39	19	38 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 15:19
L40	0	39 and L29	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:41
L41	5	39 and sulfur	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:58
L42	86	sulfate same sodium chloride same water same support	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:59
L43	63	42 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:59
L44	0	43 and L29	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:58
L45	4	sulfate same sodium chloride same water same support same catalyst	US-PGPUB; USPAT	ADJ	ON	2007/08/14 15:06
L46	3	45 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:59
L47	7	((("5595634") or ("20020130062") or ("20020157990") or ("4700004") or ("6175007") or ("7223332") or ("5907064"))).PN.	US-PGPUB; USPAT	OR	OFF	2007/08/14 15:21
S1	2099	(208/208r,213,215,217,240,244, 246,249).CCLS.	US-PGPUB; USPAT	OR	OFF	2007/08/14 08:08
S2	401	S1 and (propane or butane or C3 or C4 or (("3" or "4") adj carbon))	US-PGPUB; USPAT	ADJ	ON	2007/08/08 14:32
S3	185	S2 and mercaptan\$2	US-PGPUB; USPAT	ADJ	ON	2007/08/14 11:09
S4	147	S3 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/08 15:06
S5	129	S4 and fraction\$5	US-PGPUB; USPAT	ADJ	ON	2007/08/08 14:40
S6	91	S4 and distillation	US-PGPUB; USPAT	ADJ	ON	2007/08/08 15:05

## EAST Search History

S7	858	distillation and (condenser heat adj1 exchanger cooler) and (boiler heater) and mercaptan\$2	US-PGPUB; USPAT	OR	ON	2007/08/08 15:56
S8	30	S1 and S7	US-PGPUB; USPAT	ADJ	ON	2007/08/08 15:06
S9	27	S8 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/08 15:21
S10	1	"6440299".pn.	US-PGPUB; USPAT	ADJ	ON	2007/08/08 15:17
S11	31	("3186935"   "3531542"   "3839486"   "4186146"   "4194964"   "4213847"   "4222961"   "4232177"   "4336407"   "4439350"   "4523048"   "4740633"   "4746419"   "4761509"   "4774375"   "4822936"   "4886594"   "4902842"   "5012021"   "5087780"   "5151172"   "5154819"   "5314614"   "5510568").PN. OR ("6440299").URPN.	US-PGPUB; USPAT; USOCR	ADJ	ON	2007/08/08 15:21
S12	23	S11 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:08
S14	290	(butane or propane or C3 or C4 or ("3" or "4") carbon)) same catalyst same mercaptan	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:07
S15	149	S14 and distillation	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:07
S16	116	S15 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:08
S17	5	(butane or propane or C3 or C4 or ("3" or "4") carbon)) same catalyst same mercaptan same distillation	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:09
S18	2	S17 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:10
S19	29	(butane or propane or C3 or C4 or ("3" or "4") carbon)) same catalyst same mercaptan same liquid	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:10
S20	0	(butane or propane or C3 or C4 or ("3" or "4") carbon)) same catalyst same liquid mercaptan	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:16
S21	26	S19 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:27
S22	3	(butane or propane or C3 or C4 or ("3" or "4") carbon)) same catalyst same liquid (mercaptan or sulfur or sulphur)	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:34

## EAST Search History

S23	0	oxidiz\$3 same high\$2 boiling point (mercaptan or sulfur or sulphur or thiophene or disulfur)	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:27
S24	266	oxidiz\$3 same high\$2 (mercaptan or sulfur or sulphur or thiophene or disulfur)	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:27
S25	228	S24 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:36
S26	54	S25 and distillation	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:27
S27	1348	(butane or propane or C3 or C4 or ("3" or "4") carbon) same catalyst same (mercaptan or sulfur or sulphur)	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:35
S28	288	(butane or propane or C3 or C4 or ("3" or "4") carbon) same distillation same (mercaptan or sulfur or sulphur)	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:37
S29	132	S28 and oxidation	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:35
S30	112	S29 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:38
S31	17672	(butane or propane or C3 or C4 or ("3" or "4") carbon) same (liquid mercaptan or sulfur or sulphur)	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:38
S32	51	(butane or propane or C3 or C4 or ("3" or "4") carbon) same (liquid mercaptan or sulfur or sulphur)	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:38
S33	51	S32 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/13 16:38
S34	30	S33 and distillation	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:07
S35	139	mercaptan same (oxygen or air) same oxidiz\$5 same water	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:07
S36	2100	(208/208r,213,215,217,240,244, 246,249).CCLS.	US-PGPUB; USPAT	OR	OFF	2007/08/14 08:08
S37	11	S36 and S35	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:08
S38	10	S37 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:17
S39	0	mercaptan same copper same sodium chloride same water	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:17
S40	1	mercaptan and catalyst and sodium chloride and water and clay support	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:17
S41	25	catalyst and sodium chloride and water and clay support	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:17

## EAST Search History

S42	24	S41 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:39
S43	21	S42 and sulfur	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:22
S44	4	((("5266546") or ("4731229") or ("5073236") or ("5431890"))).PN.	US-PGPUB; USPAT	OR	OFF	2007/08/14 08:25
S45	1	("6440299").PN.	US-PGPUB; USPAT	OR	OFF	2007/08/14 08:27
S46	11	((("4215011") or ("4232177") or ("4242530") or ("4250052") or ("4302356") or ("4307254") or ("4443559") or ("5057468") or ("5262012") or ("5266546") or ("5348710"))).PN.	US-PGPUB; USPAT	OR	OFF	2007/08/14 08:25
S47	19	(US-20030089639-\$ or US-20030116474-\$ or US-20040007502-\$ or US-20030205510-\$ or US-20030178342-\$ or US-20020157990-\$).did. or (US-7220886-\$ or US-5510568-\$ or US-7153415-\$ or US-5026950-\$ or US-5595634-\$ or US-6228254-\$ or US-6156190-\$ or US-6440299-\$ or US-6444118-\$ or US-6802961-\$ or US-7223332-\$ or US-6579444-\$ or US-5730860-\$).did.	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:28
S48	15	S47 and (oxygen or air)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:29
S49	10	S47 and (oxygen or air) and (water or steam) and distillation	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:33
S50	10	S47 and (oxygen or air) and (water) and distillation	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:38
S51	2950	remov\$3 sulfur same hydrogen	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:38
S52	13	(remov\$3 sulfur same hydrogen).ti.	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:38
S53	9	S52 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:54
S54	8	S53 and (air or oxygen or "o.sub. 2")	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:44
S55	7	S53 and (air or oxygen or "o.sub. 2") and water	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:49
S56	1	johnson matthey KSR	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:49
S57	499	ksr	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:50

## EAST Search History

S58	48	S57 and sulfur	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:50
S59	26	S58 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:51
S60	107487	catalyst and alkali metal	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:52
S61	3099	catalyst and alkali metal and transition metal catalyst	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:53
S62	1667	catalyst and alkali metal and transition metal catalyst and (sulfur or mercaptan)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:53
S63	530	catalyst and alkali metal and transition metal catalyst and (sulfur or mercaptan) and sodium chloride	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:53
S64	124	catalyst and alkali metal and transition metal catalyst and (sulfur or mercaptan) and sodium chloride and clay	US-PGPUB; USPAT	ADJ	ON	2007/08/14 08:54
S65	92	S64 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:30
S66	3	S65 and sulfur.ab.	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:29
S67	4	mercaptan oxidiz\$ oxygen	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:30
S68	4	S67 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:36
S69	4529	mercaptan same disulfide	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:43
S70	300	S36 and S69	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:43
S71	250	S70 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:43
S72	203	S71 and catalyst and (VII or VIII or I or transition metal)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:51
S73	2	S72 and sodium chloride	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:38
S74	169	S72 and (oxygen or air or "O.sub. 2")	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:38
S75	91	S74 and distillation	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:39
S76	665	mercaptan same disulfide same (oxygen or air)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:43
S77	51	S36 and S76	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:43

## EAST Search History

S78	42	S77 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:31
S79	33	S78 and catalyst and (VII or VIII or I or transition metal)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:53
S80	26	S79 and water	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:53
S81	24	(US-20030089639-\$ or US-20030116474-\$ or US-20040007502-\$ or US-20030205510-\$ or US-20030178342-\$ or US-20020157990-\$ or US-20020130062-\$ or US-20040026297-\$).did. or (US-7220886-\$ or US-5510568-\$ or US-7153415-\$ or US-5026950-\$ or US-5595634-\$ or US-6228254-\$ or US-6156190-\$ or US-6440299-\$ or US-6444118-\$ or US-6802961-\$ or US-7223332-\$ or US-6579444-\$ or US-5730860-\$ or US-6175007-\$ or US-4700004-\$ or US-6485633-\$). did.	US-PGPUB; USPAT	ADJ	ON	2007/08/14 09:57
S82	8	S81 and (clay or charcoal)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:31
S83	1	"4049572".ph.	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:29
S84	4344	copper sulfate and sodium chloride	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:30
S85	1639	copper sulfate same sodium chloride	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:30
S86	447	S85 and sulfur	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:31
S87	579	copper sulfate same sodium chloride same water	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:34
S88	241	S87 and sulfur	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:31
S89	51	S88 and (clay or charcoal)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:31
S90	41	S89 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:07
S91	4	copper sulfate same sodium chloride same water same (Clay or charcoal)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 14:34
S92	3324	mercaptan same (oxygen or air)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:51



## EAST Search History

S93	1528	mercaptan with (oxygen or air)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:51
S94	427	S93 same catalyst	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:51
S95	336	S94 and (VII or VIII or I or transition metal)	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:51
S96	295	S95 and @ad<"20031030"	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:53
S97	140	S96 and distillation	US-PGPUB; USPAT	ADJ	ON	2007/08/14 10:54